In the Claims

1. (Canceled)

2. (Canceled)

3. (Canceled)

4. (Amended) A method ~~in accordance with claim 3, wherein the step~~ of optimizing the efficiency of a combustion device comprising at least three control zones, each of said control zones comprising at least one burner assembly, said method comprising:

a) individually supplying fuel to each of said burner assemblies in each of said control zones;

b) individually measuring a combustion characteristic of the collective combusted gas from said burner assemblies in each of said control zones, wherein said combustion characteristic is oxygen concentration; and

c) individually adjusting the flow of air to each of said burner assemblies in each of said control zones ~~of step c)~~ in response to the value of said combustion characteristic corresponding to each of said control zones to keep the value of said combustion characteristic within a predetermined range, wherein said step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones is performed such that the oxygen concentration in said collective combusted gas for each of said control zones is in the range of from about 0.5 to about 5.0 volume %, based on the total volume of said collective combusted gas.

5. (Amended) A method in accordance with claim ~~3~~4 wherein the step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones of step c) is performed such that the oxygen concentration in said collective combusted gas for each of said control zones is in the range of from about 1.0 to about 3.0 volume %, based on the total volume of said collective combusted gas.

6. (Amended) A method in accordance with claim ~~3~~4 wherein the step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones of step c) is performed such that the oxygen concentration in said collective combusted gas for each of said control zones is in the range of from 1.5 to 2.0 volume %, based on the total volume of said collective combusted gas.

7. (Canceled)

8. (Amended) A method ~~in accordance with claim 7, wherein the step~~ of optimizing the efficiency of a combustion device comprising at least three control zones, each of said control zones comprising at least one burner assembly, said method comprising:

a) individually supplying fuel to each of said burner assemblies in each of said control zones;

b) individually measuring a combustion characteristic of the collective combusted gas from said burner assemblies in each of said control zones, wherein said combustion characteristic is carbon dioxide concentration; and

c) individually adjusting the flow of air to each of said burner assemblies in each of said control zones ~~of step c)~~ in response to the value of said

combustion characteristic corresponding to each of said control zones to keep the value of each of said combustion characteristic within a predetermined range, wherein said step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones is performed such that the carbon dioxide concentration in said collective combusted gas for each of said control zones is greater than about 2.0 volume %, based on the total volume of said collective combusted gas.

9. (Amended) A method in accordance with claim ~~7~~ 8 wherein the step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones of step c) is performed such that the carbon dioxide concentration in said collective combusted gas for each of said control zones is greater than about 5.0 volume % , based on the total volume of said collective combusted gas.

10. (Amended) A method in accordance with claim ~~7~~ 8 wherein the step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones of step c) is performed such that the carbon dioxide concentration in said collective combusted gas for each of said control zones is greater than about 10.0 volume %, based on the total volume of said collective combusted gas.

11. (Canceled)

12. (Amended) A method ~~in accordance with claim 11, wherein the step~~ of optimizing the efficiency of a combustion device comprising at least three control zones, each of said control zones comprising at least one burner assembly, said method comprising:

a) individually supplying fuel to each of said burner assemblies in each of said control zones;

b) individually measuring a combustion characteristic of the collective combusted gas from said burner assemblies in each of said control zones, wherein said combustion characteristic is carbon monoxide concentration; and

c) individually adjusting the flow of air to each of said burner assemblies in each of said control zones in response to the value of said combustion characteristic corresponding to each of said control zones to keep the value of each of said combustion characteristic within a predetermined range, wherein the step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones ~~of step c)~~ is performed such that the carbon monoxide concentration in said collective combusted gas for each of said control zones is less than about 1000 ppmv, based on the total volume of said collective combusted gas.

13. (Amended) A method in accordance with claim ~~11~~ 12 wherein the step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones of step c) is performed such that the carbon monoxide concentration in said collective combusted gas for each of said control zones is less than about 500 ppmv, based on the total volume of said collective combusted gas.

14. (Amended) A method in accordance with claim ~~11~~ 12 wherein the step of individually adjusting the flow of air to each of said burner assemblies in each of said control zones of step c) is performed such that the carbon monoxide concentration in said collective combusted gas for each of said control zones is substantially 0 ppmv, based on the total volume of said collective combusted gas.

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Amended) A method ~~in accordance with claim 18, wherein the step~~ of optimizing the efficiency of a combustion device comprising at least three control zones, each of said control zones comprising at least one burner assembly, said method comprising:

a) individually supplying fuel to each of said burner assemblies in each of said control zones;

b) individually supplying primary air to each of said burner assemblies in each of said control zones for mixture and at least partial combustion with said fuel supplied thereto thereby producing a separate intermediate combustion product for each of said burner assemblies;

c) individually supplying secondary air to each of said burner assemblies and each of said control zones for mixture with said intermediate combustion product for further combustion thereby producing a combusted gas stream for each of said burner assemblies;

d) individually measuring a combustion characteristic of the collective combusted gas from said burner assemblies in each of said control zones, wherein said combustion characteristic is oxygen concentration; and

e) individually adjusting the flow of said primary air and ~~of~~ individually adjusting the flow of said secondary air to each of said burner assemblies

in each of said control zones in response to the value of said combustion characteristic corresponding to each of said control zones to keep the value of each of said combustion characteristics within a predetermined range, wherein the flow of said primary air to each of said burner assemblies is adjusted in response to the value of said combustion characteristic corresponding to each of said control zones first, followed by adjustment of the flow of said secondary air, as needed, in order to keep the value of said combustion characteristic within said predetermined range, and wherein said step of individually adjusting the flow of said primary air and individually adjusting the flow of said secondary air to each of said burner assemblies ~~of step e)~~ is performed such that the oxygen concentration in said collective combusted gas corresponding to each of said control zones is in the range of from about 0.5 to about 5.0 volume %, based on the total volume of said collective combusted gas.

20. (Amended) A method in accordance with claim ~~18~~ 19 wherein the step of individually adjusting the flow of said primary air and of individually adjusting the flow of said secondary air to each of said burner assemblies of step e) is performed such that the oxygen concentration of said collective combusted gas corresponding to each of said control zones is in the range of from about 1.0 to about 3.0 volume %, based on the total volume of said collective combusted gas.

21. (Amended) A method in accordance with claim ~~18~~ 19 wherein the step of individually adjusting the flow of said primary air and of individually adjusting the flow of said secondary air to each of said burner assemblies of step e) is performed such that the oxygen concentration of said collective combusted gas

corresponding to each of said control zones is in the range of from 1.5 to 2.0 volume %, based on the total volume of said collective combusted gas.

22. (Cancel)

23. (Amended) A method ~~in accordance with claim 22, wherein the step~~ of optimizing the efficiency of a combustion device comprising at least three control zones, each of said control zones comprising at least one burner assembly, said method comprising:

a) individually supplying fuel to each of said burner assemblies in each of said control zones;

b) individually supplying primary air to each of said burner assemblies in each of said control zones for mixture and at least partial combustion with said fuel supplied thereto thereby producing a separate intermediate combustion product for each of said burner assemblies;

c) individually supplying secondary air to each of said burner assemblies in each of said control zones for mixture with said intermediate combustion product for further combustion thereby producing a combusted gas stream for each of said burner assemblies;

d) individually measuring a combustion characteristic of the collective combusted gas from said burner assemblies in each of said control zones wherein said combustion characteristic is carbon dioxide concentration; and

e) individually adjusting the flow of said primary air and ~~of~~ individually adjusting the flow of said secondary air to each of said burner assemblies in each of said control zones in response to the value of said combustion characteristic

<u>corresponding to each of said control zones to keep the value of each of said combustion characteristics within a predetermined range, wherein the flow of said primary air to each of said burner assemblies in each of said control zones is adjusted in response to the value of said combustion characteristic corresponding to each of said control zones first, followed by adjustment of the flow of said secondary air, as needed, in order to keep the value of each of said combustion characteristics within said predetermined range, and wherein said step of individually adjusting the flow of said primary air and individually adjusting the flow of said secondary air to each of said burner assemblies</u> ~~of step e)~~ is performed such that the carbon dioxide concentration in said collective combusted gas corresponding to each of said control zones is greater than 2.0 volume %, based on the total volume of said collective combusted gas.

24. (Amended) A method in accordance with claim ~~22~~ <u>23</u> wherein the step of individually adjusting the flow of said primary air and of individually adjusting the flow of said secondary air to each of said burner assemblies of step e) is performed such that the carbon dioxide concentration of said collective combusted gas corresponding to each of said control zones is greater than about 5.0 volume % , based on the total volume of said collective combusted gas.

25. (Amended) A method in accordance with claim ~~22~~ <u>23</u> wherein the step of individually adjusting the flow of said primary air and of individually adjusting the flow of said secondary air to each of said burner assemblies of step e) is performed such that the carbon dioxide concentration of said collective combusted

gas corresponding to each of said control zones is greater than 10.0 volume % , based on the total volume of said collective combusted gas.

26. (Cancel)

27. (Amended) A method ~~in accordance with claim 26, wherein the step~~ of optimizing the efficiency of a combustion device comprising at least three control zones, each of said control zones comprising at least one burner assembly, said method comprising:

a) individually supplying fuel to each of said burner assemblies in each of said control zones;

b) individually supplying primary air to each of said burner assemblies in each of said control zones for mixture and at least partial combustion with said fuel supplied thereto, thereby producing a separate intermediate combustion product for each of said burner assemblies;

c) individually supplying secondary air to each of said burner assemblies in each of said control zones for mixture with said intermediate combustion product for further combustion thereby producing a combusted gas stream for each of said burner assemblies;

d) individually measuring a combustion characteristic of the collective combusted gas from said burner assemblies in each of said control zones, wherein said combustion characteristic is carbon monoxide concentration; and

e) individually adjusting the flow of said primary air and ~~of~~ individually adjusting the flow of said secondary air to each of said burner assemblies ~~of step c)~~ in each of said control zones in response to the value of said combustion

characteristic corresponding to each of said control zones to keep the value of each of said combustion characteristics within a predetermined range, wherein the flow of said primary air to each of said burner assemblies is adjusted in response to the value of said combustion characteristic corresponding to each of said control zones first, followed by adjustment of the flow of said secondary air, as needed, in order to keep the value of each of said combustion characteristics within said predetermined range, and wherein said step of individually adjusting the flow of said primary air and of individually adjusting the flow of said secondary air to each of said burner assemblies ~~of step e)~~ is performed such that the carbon monoxide concentration of said collective combusted gas corresponding to each of said control zones is less than about 1000 ppmv, based on the total volume of said collective combusted gas.

28. (Amended) A method in accordance with claim ~~26~~ 27 wherein the step of individually adjusting the flow of said primary air and of individually adjusting the flow of said secondary air to each of said burner assemblies of step e) is performed such that the carbon monoxide concentration of said collective combusted gas corresponding to each of said control zones is less than about 500 ppmv, based on the total volume of said collective combusted gas.

29. (Amended) A method in accordance with claim ~~26~~ 27 wherein the step of individually adjusting the flow of said primary air and of individually adjusting the flow of said secondary air to each of said burner assemblies of step e) is performed such that said carbon monoxide concentration of said collective combusted gas corresponding to each of said control zones is substantially 0 ppmv, based on the total volume of said collective combusted gas.

30. (Cancel)

31. (Cancel)

32. (Cancel)

33. (Cancel)

34. (Cancel)

35. (Cancel)

36. (Cancel)

37. (Amended) A method ~~in accordance with claim 35 wherein~~ of increasing the efficiency of a combustion device comprising the following steps:

a) providing a combustion device comprising:

i) at least three control zones, each of said control zones comprising at least one burner assembly;

ii) at least one gas analyzer operably related to each of said control zones for receiving and analyzing samples of combusted gas from each of said control zones;

iii) each of said burner assemblies comprising:

a) a fuel introduction means for introducing fuel into said burner assembly;

b) a primary air introduction means for introducing primary air into said burner assembly for mixture and at least partial combustion with said fuel, thereby producing an intermediate combustion product; and

c) a secondary air introduction means for introducing secondary air into said burner assembly for mixture and further combustion with said intermediate combustion product, thereby producing a combusted gas stream for each of said burner assemblies; and

iv) control means operably related to said primary air introduction means, said secondary air introduction means, and said at least one gas analyzer, for adjusting the flow of primary air and the flow of secondary air to each of said burner assemblies in each of said control zones through said primary air introduction means and said secondary air introduction means, respectively, in response to the value of a combustion characteristic measured in the collective combusted gas streams corresponding to each of said control zones~~.~~;

b) introducing fuel into each of said burner assemblies in each of said control zones via said fuel introduction means;

c) introducing primary air into said burner assemblies in each of said control zones via said primary air introduction means for mixture and at least partial combustion with said fuel thereby producing an intermediate combustion product;

d) introducing secondary air into said burner assemblies in each of said control zones via said secondary air introduction means for

mixture and further combustion with said intermediate combustion product thereby producing a combusted gas stream for each of said burner assemblies;

e) individually measuring the value of a combustion characteristic in the collective combusted gas streams corresponding to each of said control zones wherein said combustion characteristic is selected from the group consisting of oxygen concentration, carbon dioxide concentration, and carbon monoxide concentration;

f) ~~wherein the step of~~ adjusting the flow of said primary air and the flow of said secondary air to each of said burner assemblies in each of said control zones through said primary air introduction means and said secondary air introduction means, respectively, in response to the value of said combustion characteristics measured in step e) corresponding to each of said control zones wherein the flow of said primary air to each of said burner assemblies in each of said control zones is adjusted via said control means in response to the value of said combustion characteristic corresponding to each of said control zones first, followed by adjustment of the flow of said secondary air, as needed, via said control means in order to keep the value of each of said combustion characteristics within a predetermined range, wherein the step of adjusting the flow

of said primary air and the flow of said secondary air to each of said burner assemblies ~~of step f)~~ is performed such that the oxygen concentration in the collective combusted gas for each of said control zones is in the range of from about 0.5 to about 5.0 volume %, based on the total volume of said collective combusted gas~~.~~, and such that the carbon dioxide concentration in the collective combusted gas for each of said control zones is greater than about 2.0 volume-%, based on the total volume of said collective combusted gas, and such that that the carbon monoxide concentration in the collective combusted gas for each of said control zones is less than about 1000 ppmv, based on the total volume of said collective combusted gas.

38. A method in accordance with claim ~~35~~ 37 wherein the step of adjusting the flow of said primary air and the flow of said secondary air to each of said burner assemblies of step f) is performed such that the oxygen concentration in the collective combusted gas for each of said control zones is in the range of from about 1.0 to about 3.0 volume %, based on the total volume of said collective combusted gas.

39. A method in accordance with claim ~~35~~ 37 wherein the step of adjusting the flow of said primary air and the flow of said secondary air to each of said burner assemblies of step f) is performed such that the oxygen concentration in the collective combusted gas for each of said control zones is in the range of from 1.5 to 2.0 volume %, based on the total volume of said collective combusted gas.

40. (Cancel)

41. A method in accordance with claim ~~35~~ <u>37</u> wherein the step of adjusting the flow of said primary air and the flow of said secondary air to each of said burner assemblies of step f) is performed such that the carbon dioxide concentration in the collective combusted gas for each of said control zones is greater than about 5.0 volume % , based on the total volume of said collective combusted gas.

42. A method in accordance with claim ~~35~~ <u>37</u> wherein the step of adjusting the flow of said primary air and the flow of said secondary air to each of said burner assemblies of step f) is performed such that the carbon dioxide concentration in the collective combusted gas for each of said control zones is greater than 10.0 volume % , based on the total volume of said collective combusted gas.

43. (Cancel)

44. A method in accordance with claim ~~35~~ <u>37</u> wherein the step of adjusting the flow of said primary air and the flow of said secondary air to each of said burner assemblies of step f) is performed such that the carbon monoxide concentration in the collective combusted gas for each of said control zones is less than about 500 ppmv, based on the total volume of said collective combusted gas.

45. A method in accordance with claim ~~35~~ <u>37</u> wherein the step of adjusting the flow of said primary air and the flow of said secondary air to each of said burner assemblies of step f) is performed such that the carbon monoxide concentration in the collective combusted gas for each of said control zones is substantially 0 ppmv, based on the total volume of said collective combusted gas.

46. (Cancel)

47. (Cancel)

48. (Cancel)